JOB CORPS
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Job Corps Region II
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10 COMMANDMENTS OF MATH

1. Thou shalt read thy problem.
2. Whatsoever thou doest to one side of thy equation, do ye also to the other.
3. Thou must use thy "Common Sense," else thou wilt have flagpoles 9,000 feet in height, yea ... even fathers younger than sons.
4. Thou shalt ignore the teachings of false prophets to do work in thy head.
5. When thou knowest not, thou shalt look it up, and if thy search still elude thee, then thou shalt ask the all-knowing teacher.
6. Thou shalt master each step before putting thy heavy foot down on the next.
7. Thy correct answer does not prove that thou hast worked thy problem correctly. This argument convinceth none, least of all thy teacher.
8. Thou shalt first see that thou hast copied thy problem correctly before bearing false witness that the answer book lieth.
9. Thou shalt look back even unto thy youth and remember thy arithmetic.
10. Thou shalt learn, speak, write, and listen correctly in the language of mathematics, and verily A's and B's shall follow thee.

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CHALKBOARD

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Philadelphia Region

Math Instructors Attend Math Conference

SPECIAL ISSUE: Math Conference Update

The Philadelphia Regional Office and its HSD/GED Taskforce hosted a math conference March 1-3, in Baltimore, Md. Basic math instructors, GED instructors, center high school teachers and academic managers attended the conference.

89%

of Math Conference attendees evaluated the overall conference experience as excellent or good.

"The Regional Office hosted the training conference to help our teachers maximize student performance in mathematics," said Joseph Nagel, project manager at the Philadelphia Regional Office.

The two-day conference involved special guest speakers and workshop training sessions conducted by E-learning Connections and the National Center on Education and the Economy.

"The sessions were thought-provoking, and the take-home materials will be useful," said Frank Andrecht, an instructor from Earle C. Clements Job Corps Center who attended the conference.

Each attendee received a reference binder containing resources to help teachers prepare students for the math portion of the GED.

"This was the best training I have ever been to," said Mary Donahue, an instructor at Pittsburgh Job Corps Center. "It was nice to gain new ideas to improve my teaching."

For a complete overview of the conference, including notes and PowerPoint presentations from each session, go to:

www.jobcorpsregion2.com.staff/math

The math teacher saw that John wasn't paying attention in class. She called on him and said, "John! What are 4, 2, 28 and 44?"

John quickly replied, "NBC, CBS, HBO and the Cartoon Network!"

MATH for All Kinds of Minds

Challenging the Status Quo

What is the most common problem students have when taking the GED? READING THE DIRECTIONS. Job Corps teachers found this out the hard way at the recent Philadelphia Region Math Conference.

All teachers were given a test of simple math including: addition, subtraction, division and multiplication. Most teachers completed it very quickly, but almost the entire group got all of the answers wrong. Why? They didn't read the directions, which stated that all plus (+) signs indicated a need to multiply, minus (-) signs meant to use division, etc…

Job Corps students face many challenges on the GED. Most students have difficulty interpreting real-world situations, deciding how to apply math skills to these situations and working with coordinate plane grids.

"It is important for teachers to understand common problems students get incorrect, and provide solutions to help students obtain more correct answers," said Susan Pittman, presenter at the Conference from E-Learning Connections.

Calculators can also cause a student's downfall.

"A calculator doesn't make math easier, it helps a student get to the wrong answer faster if the student doesn't understand the concepts behind a problem," said Bonnie Vonracek, presenter at the Conference from E-Learning Connections.

There are four areas of the GED mathematics test: 1) number operations and number sense, 2) measurement and geometry, 3) data, statistics and probability, and 4) algebra, functions and patterns; and three types of questions on the test: 1) conceptual, 2) procedural and 3) application.

"Teachers need to help students understand the four areas of the test, think through the basic structure of the questions and hone their skills to respond appropriately," said Pittman.

Word problems are also very hard for most students. Students who have difficulty with word problems do not:

- **Read the problem carefully**
- **Follow directions**
- **Understand the math vocabulary used**
- **Use a variety of problem-solving strategies**
- **Use the appropriate process**
- **Check their answer for reasonableness**

Effective problem solvers understand a problem before attacking it, create various models and representations, use multiple problem-solving strategies, and engage in metacognitive behaviors.

"Being an effective math problem solver is not an easy task," said Pittman. "Students don't understand the vocabulary of mathematics, such as words that indicate operations and functions, and they don't understand words within each area, i.e., number sense, data, statistics and probability, measurement and geometry, algebra, etc."

There are several things teachers can do to help students with problem-solving skills, including: spend time with the student examining the solution process, model reasoning through thinking aloud, provide instruction in problem-solving strategies and use graphic or visual cues.

Problem-solving Strategies

Tips to help students dissect problems:

- **Compute or simplify**
- **Use a formula**
- **Make a model or diagram**
- **Make a table, chart or list**
- **Guess, check and revise**
- **Consider a simpler case**
- **Eliminate**
- **Look for patterns**

'I Can't Do It!'

Dealing with Math Anxiety and Learning Styles

Mathematics has a tarnished reputation in our society. It is commonly believed that math is difficult, obscure and is only mastered by those of high intelligence. Math anxiety, which is common among many Job Corps students, is a feeling of intense frustration or helplessness.

"Math anxiety affects many students at all levels of education, but it is a barrier that most can overcome," said Claire Valier, who presented a session at the math conference on behalf of E-Learning Connections.

According to Valier, if a student becomes frustrated with a problem, he or she should work on the process rather than the answer and use relaxation techniques to lower stress levels.

"You must stop negative self-talk and focus on the positives," said Valier. "Help students understand that not all math problems are solved on the first attempt."

There are several ways to make math more interesting and not so structured, including: using alternate techniques to teach basic math skills, increasing hands-on learning activities, incorporating relevant real-life situations, and reminding students of mental math tricks (such as: rounding, doubling, breaking it apart, looking for compatibles, etc.).

For nearly 70 years, teaching methods have relied on a behaviorist model of learning, which emphasizes learning-by-rote, memorization and repetition. This meant that a particular type of problem was presented together with a technique for solution, and these were practiced until sufficiently mastered.

There are three types of learners: visual, auditory and kinesthetic, and today more teachers are adapting their instruction to their students' learning styles.

Visual learners prefer to learn through written and visual materials. They tend to highlight important points in books, and they require a quiet place to work away from verbal disturbances. Visual learners need to see someone when they are speaking, not just hear them, and they rely heavily on body language and facial expressions for meaning.

Auditory learners learn through listening and taking part in discussion. They would rather make presentations than write reports; they prefer to use a tape recorder rather than take notes and are able to use mnemonics to aid memorization. Auditory learners may be overwhelmed if there is too much noise in the classroom.

Whether they are building models, doing lab activities, role-playing or performing demonstrations, kinesthetic learners learn by doing. They prefer a hands-on approach to learning and need to be able to move around. Kinesthetic learners need frequent study breaks, can work while standing/sitting on the floor, and enjoy being able to listen to music while working. Kinesthetic learners tend to remember what they have done but have trouble recalling what they have seen or heard.

To evaluate your personal learning style, take the personal learning inventory test on the Job Corps Region 2 Web Site, **www.jobcorpsregion2.com/staff/math**.

Learning style theory implies that how much individuals learn has more to do with whether instruction is geared toward their particular style of learning than whether or not they are "smart."

"Educators should not ask, Is this student smart?, but rather How is this student smart?" said Valier.